

FEDERATED MALAY STATES.

REPORT ON THE ADMINISTRATION OF THE MINES DEPARTMENT AND ON THE MINING INDUSTRIES FOR THE YEAR 1924.

PART I.  
ADMINISTRATION.

EXPENDITURE.

1. The following table shows the expenditure as estimated and as incurred :

Heading.	Estimated.	Supplement.	Total	Expenditure.	Saving.
	\$	\$	\$	\$	\$
Federal ... ..	111,487	...	111,487	87,902	23,585
Perak ... ..	189,780	622	190,402	151,506	38,896
Selangor... ..	88,720	13,512	102,232	93,009	9,223
Negri Sembilan...	32,924	4,882	37,806	34,804	3,002
Pahang ... ..	30,497	300	30,797	24,795	6,002
Total ... ..	453,408	19,316	472,724	392,016	80,708

Temporary allowances are not included in the above figures.

REVENUE.

2. Revenue was collected by the Mines Department as follows :

Federal ... ..	\$	290
Perak ... ..	61,395	
Selangor ... ..	29,312	
Negri Sembilan ... ..	5,660	
Pahang ... ..	4,496	
Total ... ..	\$101,153	

as against \$91,926 in 1923.

Classification was :

FINES, FORFEITURE AND FEES OF COURT—

Wardens' Court ... ..	\$	15,837
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FEES OF OFFICE—

Court Mines, Fees of Court ... ..	415	
Tin Buyers' and Smelters' Licences ... ..	21,815	
Dangerous Trades Licences ... ..	100	
Machinery Enactment ... ..	53,270	
Non-Ferrous Metal Industry Enactment ... ..	290	
Dulang Passes ... ..	7,794	

REIMBURSEMENTS—

Sale of Padlocks ... ..	123	
Hire of Boring Tools ... ..	254	
Miscellaneous ... ..	1,255	
Total ... ..	\$101,153	

## REVENUE FROM ALL SOURCES RELATING TO MINING.

3. The revenue from all sources relating to mining for the years 1922, 1923 and 1924 was:

Heading.						1922.	1923.	1924.
						\$	\$	\$
Federal	...	...	...	...	...	2,664	...	...
Perak	...	...	...	...	...	3,778,730	5,236,557	9,025,910
Selangor	...	...	...	...	...	2,289,884	2,686,279	3,671,695
Negri Sembilan	...	...	...	...	...	25,441	20,218	30,222
Pahang	...	...	...	...	...	435,214	281,849	398,377
Total						6,531,933	8,224,903	13,126,204

Classification for the years mentioned is as follows:

Heading.				1922.	1923.	1924.	Increase + or decrease — on 1923.
				\$	\$	\$	\$
Mines offices	...	...	...	61,199	84,331	93,069	+ 8,738
Premia on leases	...	...	...	221,026	113,242	177,645	+ 64,403
Rent on leases	...	...	...	195,136	194,572	179,335	— 15,237
Exemption from cancellation	...	...	...	864	1,820	2,845	+ 1,025
Individual licences	...	...	...	2,111	2,431	2,710	+ 279
Prospecting licences	...	...	...	3,775	5,950	11,875	+ 5,925
Export duty on tin	...	...	...	5,979,579	7,738,370	12,562,880	+ 4,824,510
"    "    gold	...	...	...	80	57	...	— 57
Commutated royalty on gold	...	...	...	123	20	...	— 20
Royalty on coal	...	...	...	66,587	74,833	87,866	+ 13,033
Ore-buyers' and goldsmiths' licences	...	...	...	1,410	1,383	185	— 1,198
Export duty on copper	...	...	...	43	...	...	...
Dulang passes	...	...	...	...	7,894	7,794	— 100
Total				6,531,933	8,224,903	13,126,204	+ 4,901,301

The increase in revenue from all sources relating to mining is mainly caused by the increased activity and is due to the high price of tin obtained during the year.

## WARDENS' COURTS.

4. (i) Two hundred and ninety-three cases were heard in the Wardens' Courts as against 176 in 1923. Convictions were obtained in all cases. There were five Civil appeals to the Supreme Court, of which three were dismissed, one was allowed and one is still pending.

(ii) In addition one hundred and sixty-seven cases were brought before the Magistrates' Courts as against 118 in the previous year. Convictions were obtained in all cases with the exception of five, of which three were dismissals and two were withdrawn. There were four Criminal appeals to the Supreme Court, of which two were allowed and in the other two the sentence was varied.

## LEGISLATION.

5. No Enactments or amendments relating to mining were passed during the year.

## REBATES.

6. Two applications for rebate of tin duty were received:

- (1) from Rawang Tin Company, Limited, for an extension of the period granted, and
- (2) from Towkay Tan Boon Chia, J.P.

The former was refused by the Hon'ble the Chief Secretary and the latter is still under consideration.

The grant of total remission of duty on all lode ore and milled ore won by the Titi Tin Company, Limited, Yap Yuen Ken's Mine on mining lease 2,043, portion 729 of Peretak mukim, and the Sungei Gau Tin Mining Company was continued during the year under report.

The remission of export duty on gold was renewed in 1924 in favour of the Raub Australian Gold Mining Company, Limited.



## STAFF.

## FEDERAL.

7. (i) Mr. G. E. Greig acted as Senior Warden of Mines till he went on long leave on 28th March, 1924. He was later confirmed in the appointment of Senior Warden of Mines, Federated Malay States, by the Secretary of State, with effect from 1st February, 1922. During the period he was on leave, Mr. A. R. Mynott, on return from leave, acted as Senior Warden till the end of the year.

Mr. F. C. Marshall, Supernumerary Warden of Mines, Federated Malay States, was seconded for service as Warden of Mines, Johore, on 1-2-21, and remained in charge there during 1924.

Mr. J. Lovett, Inspector under the Mineral Ores Enactment, Federated Malay States, went on leave on 16th March, 1924, till the end of the year.

The Federal Establishment of Supernumerary Assistant Wardens of Mines remained the same throughout the year, Messrs. A. G. Macdonald and F. H. Nash being stationed in Batu Gajah, Mr. C. I. Robinson in Bentong and Mr. A. T. Bennetts in Rasa.

The appointments of Economic Mining Geologist and Field Assistant to Economic Mining Geologist were abolished at the end of April, 1924.

## PERAK.

(ii) The appointment of Warden of Mines, Perak, remains vacant since Mr. G. E. Greig was promoted to the post of Senior Warden of Mines. Mr. H. G. Harris acted as Warden of Mines, Perak, till 5-12-24, when he went on long leave and was succeeded by Mr. A. G. Macdonald who acted for the remainder of the year.

Mr. A. G. Macdonald officiated as Assistant Warden of Mines, Perak, throughout the year.

*Larut*.—Mr. J. S. Berger, Assistant Warden of Mines, was in charge and when he went on leave on 23-6-24, Mr. G. T. Holford succeeded him and officiated for the remainder of the year.

*Kuala Kangsar*.—Captain B. L. Gard'ner, Inspector of Mines, was in charge till 7-11-24, when he was transferred to Rawang and was succeeded by Mr. G. T. Holford, Assistant Warden of Mines, Larut, in addition to his own duties. Mr. Holford was in charge for the remainder of the year.

Messrs. A. E. Kershaw, F. H. Nash, L. A. Smith and H. R. Kerr were in charge of Ipoh, Batu Gajah, Gopeng and Tapah, respectively, throughout the year.

*Kampar*.—Captain J. S. Whitworth, Inspector of Mines, was in charge till 3-9-24, when he went on leave.

Mr. L. A. Smith, Inspector of Mines, Gopeng, took over in addition to his other duties till 23-10-24, when Captain C. F. S. Jameson took charge for the remainder of the year.

## SELANGOR.

(iii) Mr. M. A. V. Allen officiated as Warden of Mines, Selangor, till 7-11-24, when he proceeded on long leave. Mr. J. Laird took over from him and acted till the end of the year.

*Rasa*.—Messrs. A. T. Bennetts, Assistant Warden, and G. A. Thrupp, Inspector of Mines, were in charge of Rasa and Kuala Lumpur, respectively, throughout the year.

*Rawang*.—Captain W. B. Hawkes, Assistant Warden of Mines, was in charge till 7-11-24, when he was transferred to Negri Sembilan and Captain B. L. Gard'ner succeeded him.

## NEGRI SEMBILAN.

(iv) Mr. A. G. Mondy officiated as Assistant Warden of Mines, Seremban and Kuantan, up to 28th April, 1924, when he went on leave and was succeeded by Mr. J. Laird who was transferred to Selangor on 7th November and replaced by Captain W. B. Hawkes who remained in charge till the close of the year.

Mr. A. J. Dishman, Assistant Warden of Mines, in the Negri Sembilan Establishment, retired on pension on 20th March, 1924.

## PAHANG.

(v) Mr. C. I. Robinson officiated as Assistant Warden of Mines, Ulu Pahang, throughout the year.

The East Coast is under the charge of the Assistant Warden of Mines, Seremban and Kuantan.

The District Officer, Kuantan, was gazetted under the Mining Enactment for the purpose of giving him powers under that Enactment to deal with cases of emergency when necessity arises.



## INSPECTORS OF MACHINERY.

(vi) *Perak*.—During the first half of the year under review the staff consisted of four Inspectors—Messrs. G. C. Marshall, J. H. Inglis and J. H. A. Trowell stationed in Ipoh, and Mr. T. Parker stationed in Taiping.

Mr. Inglis went on leave on 6-6-24 and Mr. G. C. Marshall died on 1-7-24. On the death of Mr. Marshall, Mr. A. M. Hunter was transferred from Kuala Lumpur to Ipoh on 5-8-24.

*Selangor*.—Mr. J. Graham acted as Chief Inspector of Machinery, Federated Malay States, and was in charge of the Selangor Machinery Branch till 12-9-24, when he went on leave and had under him Messrs. W. Drummond and A. M. Hunter. The latter was transferred to Perak on 5-8-24.

Mr. H. Lawson was appointed Inspector of Machinery, Perak Establishment, on 26-10-24 and is doing duty in Selangor.

*Negri Sembilan*.—Mr. A. A. Bristow, Inspector of Machinery, was in charge throughout the year. On 13th September, 1924, Mr. Bristow was appointed to act as Chief Inspector of Machinery, Federated Malay States, in addition to his other duties when Mr. J. Graham went on leave.

*Pahang*.—Inspections were carried out by the Inspectors of Machinery in Selangor.

## PART II.

## TIN MINING.

## EXPORTS.

8. (i) The total export, as recorded by the Customs, of metallic tin plus 72 per cent. of ore amounted to 739,923 pikuls as compared with 632,517 pikuls in 1923, showing an increase of 107,406 pikuls in the year under review. Of the total quantity for the year 1924, 113,267 pikuls were exported as smelted tin and 626,656 pikuls as tin-in-ore; in comparison with 98,383 pikuls and 534,134 pikuls, in 1923, respectively, showing an increase in smelted tin of 14,884 pikuls and an increase of tin-in-ore of 92,522 pikuls.

(ii) The export, as recorded by the Customs from each State, of metallic tin plus 72 per cent. of ore and its approximate value, at the local average prices for 1923 and 1924, viz., \$101.75 per pikul, and \$124.19 per pikul, respectively, was as follows (as before, it should be noted that these average prices are not true volumetric means):

State.	1923.	1923 value.	1924.	1924 value.	Pikuls.	Value.
					Increase + Decrease—	Increase + Decrease—
	Pikuls.	\$	Pikuls.	\$		\$
Perak ... ..	415,157	42,242,224	500,121	62,110,027	+ 84,964	+ 19,867,803
Selangor ... ..	184,728	18,796,074	202,112	25,100,289	+ 17,384	+ 6,304,215
Negri Sembilan ... ..	9	916	65	8,072	+ 56	+ 7,156
Pahang ... ..	32,623	3,319,390	37,625	4,672,649	+ 5,002	+ 1,353,259
Total ... ..	632,517	64,358,604	739,923	91,891,037	+ 107,406	+ 27,532,433

Reduced to tons (2,240 lbs.) the export for 1923 was 37,649 tons and for 1924 was 44,043 tons showing an increase of 6,394 tons. This is 33 per cent. of the estimated worlds output of 133,908 tons.

(iii) The figures in the foregoing table show the actual exports—ex Federated Malay States—from each State; the following table is corrected for inter-State trade and shows the export of production in each State for the last three years:

State.	1922.	1923.	1924.	1924 on 1923.
	Pikuls.	Pikuls.	Pikuls.	Pikuls.
Perak ... ..	367,051	416,174	501,304	+ 85,130
Selangor ... ..	155,756	148,713	169,566	+ 20,853
Negri Sembilan ... ..	16,114	18,016	16,056	— 1,960
Pahang ... ..	53,883	49,614	52,997	+ 3,383
Total ... ..	592,806	632,517	739,923	+ 107,406

Perak shows an increase of 20.4 per cent., Selangor an increase of 14 per cent., Negri Sembilan a decrease of 10.8 per cent., and Pahang an increase of 6.7 per cent.; the increase on the total production being 17 per cent. as compared with 1923.



## LOCAL MARKET.

9. (i) The year opened with the price at \$118 per pikul. The rise, which was in evidence during the closing stages of 1923, was continued and the price rose rapidly until March 13th when the highest price for the year, viz., \$148 was reached. An equally rapid decrease in the price then ensued which culminated on May 25th, when \$100.75, the lowest price for the year, was quoted. Thereafter an improvement took place the price rising to \$130.50 by September 4th, this was followed by a sharp setback, the price receding to \$111 on September 24th; from then onward there was an upward movement which was sustained until the end of the year. The price at the close of the year was \$137.37.

(ii) The highest price for 1924 was \$27 above that for the previous year and the lowest price touched was \$12.25 above the corresponding figure for 1923.

The following table gives figures for the last seven years in dollars per pikul:

Heading.	1918.	1919.	1920.	1921.	1922.	1923.	1924.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Highest ... ..	182 50	166 00	212 00	*115 00	93 62	121 00	148 00
Average ... ..	150 62	120 68	150 67	85 04	80 64	101 75	124 19
Lowest ... ..	117 50	100 00	90 00	72 00	71 75	88 50	100 75
Fluctuation ... ..	65 00	66 00	122 00	43 00	21 87	32 50	47 25

\*Government purchase price.

(iii) The following figures (\$ per pikul tin-ore) in connection with the local market, which must be treated as approximations, are of interest:

Year.	Ore price.	Received by miners.	Difference.	Duty.	Balance.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1918 ... ..	108 45	85 32	23 13	* 18 45	4 68
1919 ... ..	86 89	71 40	15 49	12 00	3 49
1920 ... ..	108 48	89 00	19 48	15 60	3 88
1921 ... ..	61 20	49 72	11 48	7 68	3 80
1922 ... ..	58 05	47 11	10 94	7 20	3 74
1923 ... ..	73 26	59 10	14 16	9 72	4 44
1924 ... ..	89 41	74 00	15 41	12 48	2 93

\*Includes War-tax.

The figures under "Balance" represent approximately the average deduction made on account of smelting and local costs and the low figure for 1924 was probably due to the higher price offered by the local Chinese smelters, and lower charges made.

(iv) The following table shows the average London three months quotation in comparison with the average Straits price, in sterling, per ton (2,240 lbs.), for the last eight years:

Year.	London.	Straits.	Difference.	Remarks.
	£ s. d.	£ s. d.	£ s. d.	
1917 ... ..	237 11 6	213 2 7	24 8 11	Control April to December
1918 ... ..	327 12 10	295 4 4	32 8 6	
1919 ... ..	254 14 6	238 9 10	16 4 8	
1920 ... ..	297 5 11	295 6 3	1 19 8	
1921 ... ..	168 0 0	166 13 4	1 6 8	
1922 ... ..	160 14 0	158 1 0	2 13 0	
1923 ... ..	202 15 4	199 8 7	3 6 9	
1924 ... ..	249 10 6	243 8 2	6 2 4	



## LONDON MARKET.

10. The highest three months price for the year was £298 per ton and the lowest £200.10s. per ton, the average price being £249.10s.6d.

The price at the beginning of the year was £238.10s., by the middle of March it had improved to £298, a reaction followed and towards the end of May the price had fallen to £200.10s. Thereafter there was an upward fluctuating movement until the latter part of September when another sharp fall was experienced, the price dropping from £261.10s. on the 2nd September to £229.10s. on the 23rd September. From then onwards an improvement followed and the year closed with the price standing at £275.5s.

The rapid advance in the price at the beginning of the year was due to heavy American buying by consumers, assisted by reckless speculation on the part of the outside public. The subsequent reaction was due to a considerable falling off in the American demand due to trade depression in that country. Existing circumstances did not warrant the figure to which the price rose neither was the figure to which it fell justified.

The most notable feature of the year was the liquidation of the pooled stocks held under the Bandoeng Agreement. These stocks were, at the beginning of the year, approximately 10,000 tons. That the whole amount was successfully unloaded without any appreciable disturbance of the market, demonstrates the soundness of the consuming demand during the year. The fact that the market was able to absorb these stocks is all the more remarkable when it is considered that there was an increase in the Federated Malay States production of over 6,000 tons with, as far as is known, no corresponding decrease in production elsewhere.

Current consumption is considerably in excess of production and has been for some time past. Assuming that the present rate of consumption is maintained, and there is no reason in sight at present why it should not be, then it seems inevitable that there will be a considerable appreciation in the price during the coming year.

## PART III.

## OTHER MINING.

## TUNGSTEN ORES.

11. (i) The total export of tungsten ores of Federated Malay States origin as shown by the Customs returns was 1,638 pikuls (975 tons) as compared with 631 pikuls (37 tons) in 1923.

(ii) The export of wolfram of Federated Malay States origin as tabulated from Customs returns was as follows for the last three years:

State.							1922.	1923.	1924.
							Pikuls.	Pikuls.	Pikuls.
Perak	...	...	...	...	...	...	...	...	...
Selangor	...	...	...	...	...	...	934	...	...
Negri Sembilan	...	...	...	...	...	...	657	631	140
Pahang	...	...	...	...	...	...	...	...	...
Total							1,591	631	140

(iii) The export of scheelite of Federated Malay States origin as shown by Customs returns was as follows:

State.							1922.	1923.	1924.
							Pikuls.	Pikuls.	Pikuls.
Perak	...	...	...	...	...	...	6	...	1,246
Selangor	...	...	...	...	...	...	...	...	252
Negri Sembilan	...	...	...	...	...	...	...	...	...
Pahang	...	...	...	...	...	...	...	...	...
Total							6	...	1,498



(iv) The production of tungsten ores in each State, after correcting export figures for inter-State trade, was, as nearly as can be ascertained, as follows:

State.	1922.	1923.	1924.
	Pikuls.	Pikuls.	Pikuls.
Perak ... ..	6	...	1,498
Selangor ... ..	853	...	...
Negri Sembilan ... ..	738	668	140
Pahang ... ..	...	...	...
Total ...	1,597	668	1,638

The year under review shows an increase in production of 970 pikuls. The export duty on tungsten ores was still in abeyance.

(v) Tungsten-bearing ore from other countries, sent to the Federated Malay States for treatment, resulted in a re-export of 2,352 pikuls of clean ore as compared with 524 pikuls in 1923.

#### GOLD.

12. (i) The quantity of gold placed upon the market was as follows for the years noted:

State.	1922.	1923.	1924.
	Ozs.	Ozs.	Ozs.
Perak ... ..	1,143	883	2,112
Negri Sembilan ... ..	81	83	...
Pahang ... ..	13,781	8,601	12,848
Total ...	15,005	9,567	14,960

For the year under review the Raub Mine produced 12,268 ounces.

#### COAL.

13. (i) The output from the Malayan Collieries, Limited (Selangor), for the last four years was as follows:

1921 ... ..	299,351 tons
1922 ... ..	281,828 „
1923 ... ..	317,892 „
1924 ... ..	372,795 „

an increase of 54,903 tons on the preceding year, making a total of 2,148,465 tons since production commenced.

(ii) Coal for the year was consumed as follows:

Federated Malay States Railways ... ..	192,692 tons
Mines ... ..	145,969 „
Other Federated Malay States Consumers ... ..	6,808 „
Exported ... ..	5,995 „
Total ...	351,464 „

In addition 21,331 tons were consumed at the Collieries.

(iii) The power of the plant was 1,690 horse-power.

(iv) The following is an abstract from a report submitted by the Malayan Collieries, Limited, for the year in question:

In the top seam the mines operating are north mine and Nos. 5 and 6 opencast mines. In the bottom seam the mines operating are the east mine and No. 2 opencast.

*North Mine.*—The mine has had a very good year and everything ran very smoothly with the exception of a period during the month of October when there was an interruption caused by an inrush of water from the South Mine. The pump room and all the pumps were flooded and work was partially suspended for about a month. Surface pumps were brought down and the water cleared away and by the beginning of November the mine was working normally again. The output has been maintained at about 13,000 tons per month and towards the latter end of the year reached 14,000 tons.

No fire of any consequence occurred during the year.



*East Mine.*—The main deep has not been advanced during the year and still remains at the 1,100 feet level. The left-hand level was driven a distance of 504 feet when it ran into very faulted ground and was stopped. The right-hand heading has been driven a distance of 800 feet and is still going ahead in excellent coal.

*Opencast Mines.*—No. 1 opencast was finished early in the year. Nos. 2, 5 and 6 are still being worked. A section of long wall face 450 feet long has been opened up and is ready for operating on when required.

*Plant.*—No additions were made to the plant during the year.

(iv) Renewed interest has been taken in the deposit of coal at Enggor. This coal is similar in type to that at Rawang, and it is to be hoped that the people interested in this small deposit will succeed in winning the coal and so add to the fuel resources of the country.

#### QUARRIES.

14. The tonnage of stone quarried by the Public Works Department, mainly for use on roads, was as follows:

State.							1922.	1923.	1924.
							Tons.	Tons.	Tons.
Perak	...	...	...	...	...	...	95,744	114,299	142,983
Selangor	...	...	...	...	...	...	161,635	166,495	167,721
Negri Sembilan	...	...	...	...	...	...	60,657	66,102	61,318
Pahang	...	...	...	...	...	...	50,302	32,000	69,025
Total ...							368,338	378,896	441,047

As in former years stone was also quarried for railway purposes.

#### CEMENT MANUFACTURE.

15. The manufacture of cement at Batu Caves has stopped. The plant was unsuitable and cement from Great Britain could be purchased here cheaper than this cement.

#### PART IV.

#### LABOUR, MACHINERY AND TIN MINING LANDS.

##### LABOUR.

16. (i) The labour force employed on mining at the end of the year under review (inclusive of individual licences but exclusive of holders of dulang passes) was 106,479, all of whom, with the exception of 581 on gold and 1,972 on coal, were employed on tin and tungsten mining. The highest figure was 229,778 in 1907, before labour was so largely replaced by machinery. These figures do not include labour employed on extraction and transport of firewood.

(ii) The labour force in each State in December was as follows for the last three years:

State.							1922.	1923.	1924.
Perak	...	...	...	...	...	...	45,726	61,655	63,794
Selangor	...	...	...	...	...	...	27,226	25,946	32,750
Negri Sembilan	...	...	...	...	...	...	2,546	2,450	2,744
Pahang	...	...	...	...	...	...	6,697	6,611	7,191
Total ...							82,195	96,662	106,479

showing an increase of 9,817 men as compared with 1923, equivalent to 10.16 per cent.



## DULANG PASS HOLDERS.

(iii) Dulang passes were issued in each State for the last three years as shown in the following table:

State.	1922.	1923.	1924.
Perak ... ..	7,308	4,565	4,361
Selangor ... ..	4,247	2,652	2,661
Negri Sembilan ... ..	536	281	398
Pahang ... ..	662	396	374
Total ...	12,753	7,894	7,794

showing a decrease of 100 as compared with 1923. The nationalities for the year under review were: Malays 745; Chinese 6,821; Indians 227; Sakais or others 1. Dulang pass holders earned on an average \$311 per head, an increase of \$78 per head as compared with 1923. This increase is due partly to the increased price and partly to the decreased numbers of passes issued since the introduction of the \$1 fee in 1923.

## METHOD OF EMPLOYMENT OF LABOUR.

(iv) The method of employment for 1924 and the preceding year was as follows:

State.	1923.				1924.				
	Open-cast and surface.	Under-ground.	Hydraulic and lampiran.	Bucket dredging.	Open-cast and surface.	Under-ground.	Hydraulic.		Bucket dredging.
							Gravel pump.	Sluicing.	
Perak ...	13,360	5,516	38,409	4,370	11,928	2,579	36,437	7,961	4,889
Selangor ...	17,758	2,613	4,711	864	25,728	1,946	2,373	1,550	1,153
Negri Sembilan	1,222	636	356	236	978	474	370	529	393
Pahang ...	1,684	2,866	1,925	136	1,857	3,042	115	2,028	149
Total ...	34,024	11,631	45,401	5,606	40,491	8,041	39,295	12,068	6,584

In the 1924 table, gravel pump mining, strictly speaking an hydraulic method of mining, has been separated from sluicing by water with or without pressure, to show how important this form of mining, which also employed 24,636.5 horse-power, has become.

## CLASSIFICATION OF LABOUR.

(v) The following table shows the classification of labour:

State.	Contract.	Wages.	Tribute.	Individual licences.
Perak ... ..	12,413	37,752	13,629	...
Selangor ... ..	15,790	10,068	6,892	...
Negri Sembilan ... ..	510	697	1,148	389
Pahang ... ..	2,558	2,322	2,221	90
Total, 1924 ...	31,271	50,839	23,890	479
" 1923 ...	23,140	35,817	37,265	440
" 1922 ...	21,003	29,966	30,813	413

The increase in contract labour was 35.14 per cent., wages 41.94 per cent., individual licences 8.86 per cent. and the decrease in tribute 35.89 per cent.



## NATIONALITY OF LABOUR.

(vi) The nationality of those employed was as follows:

State.	European.	Chinese.	Indian.	Malays.	Others.
Perak ... ..	201	55,278	6,810	1,424	81
Selangor ... ..	67	31,119	1,207	135	222
Negri Sembilan ... ..	19	2,616	46	61	2
Pahang ... ..	57	6,412	208	468	46
Total, 1924 ...	344	95,425	8,271	2,088	351
„ 1923 ...	303	89,060	5,264	1,671	364
„ 1922 ...	297	76,449	3,678	1,563	208

The increase in Europeans was 13.53 per cent.; in Chinese 7.15 per cent.; in Indians 57.12 per cent.; in Malays 24.96 per cent. and under others 3.57 per cent. decrease.

## CHINESE IMMIGRATION AND EMIGRATION.

17. (i) The following return shows the number of Chinese adult male immigrants and emigrants entering and leaving the States *via* ports for the years 1922, 1923 and 1924:

State.	1922.		1923.		1924.	
	Immigrants.	Emigrants.	Immigrants.	Emigrants.	Immigrants.	Emigrants.
Perak ... ..	4,664	3,410	5,025	3,320	5,708	3,047
Selangor ... ..	6,597	8,698	7,659	9,539	7,916	7,963
Negri Sembilan ... ..	486	368	518	201	303	236
Pahang ... ..	1,907	1,770	1,497	881	2,121	1,347
Total ...	13,454	14,246	14,699	13,941	16,048	12,593

showing an excess of immigrants in 1924 of 3,455 over emigrants, the number of the latter being 1,348 more than that in 1923.

## MACHINERY AND HYDRAULIC APPLIANCES ON MINES.

18. The total effective horse-power of steam, gas, oil, hydraulic and electrical plant employed on all mines in the year under review is estimated at 79,077 and is classed as follows:

State.	Steam.	Steam-electric.	Hydraulic.	Hydro-electric.	Suction gas.	Oil engines.	Oil-electric.	Total, 1924.	Total, 1923.
Perak ... ..	24,009	3,100	15,056	3,951½	1,112	4,178	2,900	54,306½	49,968½
Selangor ... ..	11,428½	802	640	...	902	902	1,080	15,754½	14,056½
Negri Sembilan ... ..	1,258	...	564	...	100	8	...	1,930	1,754
Pahang ... ..	4,243	...	433	1,080	120	210	1,000	7,086	7,521
Total, 1924...	40,938½	3,902	16,693	5,031½	2,234	5,298	4,980	79,077	73,300
„ 1923...	34,812	5,470	22,068½	1,756	1,832	2,831½	4,530	73,300	
„ 1922...	29,612	2,748½	16,281	4,855	1,689	1,493	2,600	59,278½	

NOTE.—(a) The Tin Bentong's plant develops 800 K. V. A., of which 400 horse-power has been credited to the company in the above analysis as maximum dredging load.

## TIN MINING LANDS.

19. The total acreage alienated for tin mining, exclusive of unsurveyed concessions, was as follows, for the years 1922, 1923 and 1924:

State.	1922	1923.	1924.
Perak ... ..	104,482	101,984	95,878
Selangor ... ..	81,099	58,920	51,709
Negri Sembilan ... ..	13,024	8,421	8,465
Pahang ... ..	17,956	25,279	23,938
Total ...	216,561	194,604	179,990

a decrease of 14,614 acres as compared with 1923.



## PART V.

## GENERAL REMARKS ON MINING OPERATIONS.

## WEATHER AND ITS EFFECT ON MINING.

20. The weather was abnormally wet especially in Perak, where in every locality the rainfall was greater than the previous year. The effect was an abundance of water for the hydraulic miners.

## TIMBER AND FUEL SUPPLY.

21. (i) The consumption on mines was recorded as follows in tons but the figures cannot be regarded as reliable:

State.	Coal.	Oil.	Wood.
Perak ... ..	77,700	5,000	676,900
Selangor ... ..	89,678	1,729	159,338
Negri Sembilan ... ..	—	—	62,415
Pahang ... ..	—	1,341	52,389
Total, 1924 ... ..	167,378	8,070	951,042
„ 1923 ... ..	146,545	4,576	791,015
„ 1922 ... ..	103,916	2,640	701,137

an increase of 20,833 tons of coal, 3,494 tons of oil and 160,027 tons of wood as compared with 1923.

Four hundred and thirty-nine tons of charcoal and 20 tons of coke used in 1924 in Pahang were not included in the above table.

(ii) There were adequate supplies of fuel throughout the year, but the price of firewood in all districts in Perak increased, in some cases as much as 25 per cent. The price of oil and coal remained the same.

(iii) The price of foreign coal remained about the same with a slight tendency to drop.

## PROSPECTING.

22. (i) Areas covered by prospecting licences and areas selected were as follows:

State.	No. of licences.	Area under licences.	Area selected.
Perak ... ..	73	23,984	1,524
Selangor ... ..	8	1,339	122
Negri Sembilan ... ..	7	3,050	—
Pahang ... ..	14	26,960	50
Total, 1924 ... ..	102	55,333	1,696
„ 1923 ... ..	53	54,663	1,625
„ 1922 ... ..	34	42,142	458

showing an increase in all cases.

(ii) Great activity in search of new dredgable areas continues but without any very great success.

## MINING LANDS.

23. (i) According to the Land Office returns the following acreages of mining land were converted to agriculture:

	Acre.
Perak ... ..	—
Selangor ... ..	—
Negri Sembilan ... ..	—
Pahang ... ..	—
Total, 1924 ... ..	—
„ 1923 ... ..	41
„ 1922 ... ..	4

showing a decrease of 41 acres for the year under review as compared with the previous year.



(ii) Acreage of agricultural land converted to mining, similarly ascertained, was as follows:

	Acres.								
Perak ... ..	...	...	...	...	...	...	...	...	295
Selangor ... ..	...	...	...	...	...	...	...	...	305
Negri Sembilan ... ..	...	...	...	...	...	...	...	...	5
Pahang ... ..	...	...	...	...	...	...	...	...	72
Total, 1924 ...									677
,, 1923 ...									413
,, 1922 ...									723

showing an increase of 264 acres as compared with 1923.

#### ACCIDENTS.

24. (i) The total number of deaths due to accidents was as follows for the years 1922, 1923 and 1924:

State.	1922.	1923.	1924.
Perak ... ..	45	44	73
Selangor ... ..	56	35	40
Negri Sembilan ... ..	5	3	5
Pahang ... ..	14	6	16
Total ...	120	88	134

The gross death-rate for the year under review on a labour force of 106,479 works out as 1.26 per thousand as against .91 in 1923.

(ii) The analysis of fatal accidents is:

#### MISCELLANEOUS.

Nature.	Perak.	Selangor.	Negri Sembilan.	Pahang.
Electrical ... ..	—	—	—	—
Auxiliary operations ...	2	1	—	—
Surface ... ..	6	8	—	—
Shallow workings ...	—	—	5	9
Cliff workings ...	1	—	—	—
Bucket dredges ...	5	3	—	—
Other causes ... ..	—	—	—	1
Total ...	14	12	5	10

#### DEEP OPEN-CASTS.

Nature.	Perak.	Selangor.	Negri Sembilan.	Pahang.
Falls of earth or rock	38	16	—	—
Rushes of water or mud	8	—	—	—
Other causes ... ..	8	11	—	—
Total ...	54	27	—	—

#### UNDERGROUND.

Nature.	Perak.	Selangor.	Negri Sembilan.	Pahang.
Falls of earth, rock or timber...	1	—	—	4
Rushes of water or mud ...	2	—	—	—
Foul air or gas explosions ...	—	1	—	1
Falling down shafts ... ..	2	—	—	1
Blasting ... ..	—	—	—	—
Other causes ... ..	—	—	—	—
Total ...	5	1	—	6

The death-rate per thousand among the underground miners is estimated at 1.49 as against .946 in 1923 and 2.35 in 1922.



## LABOUR SUPPLY.

25. On the whole the labour supply was plentiful throughout the greater part of the year though there was a shortage in Kinta at the end of the year.

Wages have risen 20 per cent. since the beginning of 1924.

## MINING METHODS AND MACHINERY.

26. There was no difficulty in obtaining all forms of machinery which remained at about the same price as last year.

The number of bucket dredges increased by two and there were nine under construction and about ten more proposed. The capacity of these dredges is increasing the largest now being capable of treating 200,000 cubic yards a month.

The use of suction cutters introduced recently increased and there are now four in use and four under construction. Engineers connected with them are full of confidence in the eventual success of this method of excavation though numerous modifications will be necessary before a really satisfactory type has been devised as was and is the case with bucket dredges. The pro-bucket engineers are not so enthusiastic.

The costs of each type have come down and now stand at about £50,000 for a bucket dredge to cut 200,000 cubic yards a month and £35,000 to £45,000 for a suction cutter dredge of capacity of 150,000 cubic yards a month.

The difficulty presented by clay in treating dredged ground especially by classifiers and jigs has been largely overcome, but the use of classifiers and jigs though recognised as more efficient than sluice boxes is not being adopted to any great extent owing to the cost of construction and royalty and concentration is being carried on mainly by sluice boxes with the resultant admitted loss of between 10 and 15 per cent.

Chinese still continue to use electric power when they can get it, for their gravel pumps, but the supply is small at the moment.

Messrs. Armstrong Whitworth have completed their investigations regarding the use of the Perak river for developing electric power but no conclusion had been reached at the end of the year.

The use of rubber in the shoots of dredges mentioned last year has now been proved to be a distinct success, in fact from the rubber producers point of view too much so as the wear is inappreciable.

The most noticeable feature of the year was the enormously increased use of the gravel pump by Chinese there being now <sup>285</sup> such mines in the Federated Malay States. This method first became popular in a small way when costs were high and the tin price low. Now when the conditions are reversed this method of mining has become extremely popular, especially in Kinta where in places one sees a series of the scaffoldings used one after the other for several miles.

Some of the excavations made have become very large, one being about 16 acres in area and over 100 feet deep.

An innovation is the installation of a puddler at the bottom of one mine which breaks up heavy ground before it is elevated by the gravel pump.

## MINES.

27. Although no great changes have taken place, there are several items of interest worth recording.

(i) Rahman Hydraulic Tin Limited are getting on well with their new scheme. Work in connection with the power station on the Sungei Rui is progressing well and reservoirs for water supplies are being made. It is satisfactory to note that the dumping grounds for tailings are much larger and more satisfactory than the very restricted one now in use in the Endah Valley. Great care is being taken in devising the most satisfactory and suitable plant for treating the ground economically. Development of the ore bodies in the mountain is being carried on vigorously and with satisfactory results though the deposits are patchy. This mine should have a long life ahead of it.

(ii) Tanjong Toh Allang, at one time considered dead, is now showing more mining activity than at any time in its career. There are four very large gravel pump mines and several smaller ones. The deposit is very deep and bottom has not yet been reached in one mine by bores at over 200 feet from the surface.

(iii) An interesting discovery known now as the Beatrice Mine was made in 1923 and has since developed very well. It is at Selibin near Ipoh and is a lode in the limestone. It is an extremely rich deposit and yielded 17,500 pikuls during 1924 and a profit of \$500,000. The mine was opened on a capital of \$4,000 and pays 8½ per cent. to the fortunate sub-lessor.

Similar deposits have been found in the limestone near the Kledang range and as far as Siputeh but none of them have been as rich as this deposit is.



(iv) Lode mining in the Peretak area continues vigorously and was responsible for an output of 7,400 pikuls out of a total of 17,800 pikuls.

This work is difficult as the lodes in most cases are not defined clearly and often take the form of impregnations in the granite. Great courage is shown by the Chinese in exploiting these deposits at great cost.

(v) Much interest is being shown in the deposits in the Klang Valley below Kuala Lumpur and it is likely that this area will become an important source of tin in the near future—at the expense of some rubber land.

(vi) Mining in Negri Sembilan is growing. Titi Tin is making an effort to put itself on a proper working basis and proposals are being made for new enterprises which if carried out will add considerably to the mining prosperity of the State.

(vii) No great changes have taken place in Pahang except that Pahang Consolidated Company Limited has lost its place as the biggest producer of tin in the world to Bolivia where one or two mines are reported to have a much larger output.

#### DREDGING.

28. At the end of the year there were 38 bucket dredges and 4 suction cutters in operation and 6 bucket dredges and 4 suction cutters were under construction as compared with 40 bucket dredges in operation and 3 under construction in the previous year.

The following table gives more details:

State.	Number working all the year.		Number working at end of the year.		Number under construction.	
	B. dredge.	S. cutter.	B. dredge.	S. cutter.	B. dredge.	S. cutter.
Perak ... ..	30	...	30	2	3	1
Selangor ... ..	5	...	5	1	3	2
Negri Sembilan ... ..	2	...	2	1	...	...
Pahang ... ..	1	...	1	...	...	1
Total, 1924 ...	38	...	38	4	6	4
„ 1923 ...	33	...	40	...	3	...
„ 1922 ...	22	...	33	...	9	...

The number of new dredges proposed to be built in the future is roughly, as far as is known at present, 10.

#### TAILINGS.

##### GENERAL.

29. The control of tailings from present workings was satisfactory.

The experiment of giving concessions to various mines to pass a much greater amount of fine material than the rules allow while at the same time greatly reducing the amount of coarse material allowed to pass has proved a great success, the rivers carrying away the fine material easily and so reducing the burden on the mines.

Generally the concessions permitted the unlimited discharge of matter smaller than 150 I.M.M. mesh screen and the larger material was limited to not more than 20 grains per gallon of matter larger than 80 mesh or nothing larger than 60 mesh.

The I.M.M. standard screen is one in which the spaces are of equal size with the wires so that a 150 mesh screen means holes  $1/300$  inch in diameter.

The rule which governs the discharge of tailings permits an effluent of 800 grains per gallon without reference to size.

Mr. Smail in his report on the Kinta river states that from his observations covering five years a greater amount of material of less than 60 mesh might be allowed to escape than allowed by the rule.

These concessions to the miners, therefore, are far within the limits of safety as laid down by Mr. Smail, late Chief Hydraulic Engineer, Public Works Department.

The effect of keeping all coarse material out of the rivers will be the gradual improvement of them in the upper reaches, but at first as the upper reaches clear there will be an accumulation lower down which may make conditions for the time being worse than they were.

The attempt to grow rice on areas covered with slime although hardly successful yielding as it did 165 gantangs per acre, gave promise for the future when the ground has become better fertilised by rotting vegetation and vermin are more controlled.

*Perak* (i).—The control was strict and the result satisfactory.



(ii) The concessions granted Rahman Hydraulic Tin Limited and Hitam Mine, Lahat Mines Limited, Tekka Limited, Jelantoh Tin Limited, Wong Sen & Company, Eu Tong Sen, Societe des Etains de Kinta were of great benefit to the miners and careful observations and measurements showed that the fine material escaping passed through to the main river and did not settle. What trouble is caused now by tailings in Perak is due to the deposits of sand in rivers from old workings. These deposits have not moved far down the rivers yet, but with the cessation of further additions of coarse material it is hoped that in time the rivers will clear themselves.

(iii) It is of interest to note that at the mouth of the Kinta river which carries more mining effluent than any other river in the country, the bed of that river is muddy and much deeper than the Perak river into which it flows and which has a coarse sandy bottom.

With exception of the Intan and Temengoh Mines there are no mining effluents into the Perak river except a few negligible ones so it is clear that up to the present the coarser material which escaped from the Kinta mines before the present control was imposed has not yet reached the mouth of the River Kinta.

(iv) An interesting dam for retaining tailings was erected on the S. Sinju above Pulai in the form of a masonry arch sloping forward and 40 feet high. This is the first dam of its kind to be built in this country.

*Selangor.*—Tailings control was carried out efficiently and successfully throughout the year.

The most important and difficult tailings problem, that at Kuala Kubu, was coped with by the Peretak miners in combination and with considerable success.

The system is to so divert the river into a tailings retention compartment that except in times of flood, the whole of the river flows through and deposits its sandy burden in the compartment banded off for that purpose.

The main diverting weir was raised and is 1,098 feet long.

Two intakes are now in use and an emergency spill-way 200 feet long is in course of construction, which will function in times of flood with the present 200 feet spill-way.

The field now contains 1,000,000 cubic yards of sand, of which 700,000 cubic yards were deposited during the year under review.

*Negri Sembilan.*—There is nothing of note to report regarding tailings control in this State which was generally satisfactory.

*Pahang.*—Conditions remain as they were last year. Control where possible is effected, but the country is difficult in the hilly areas. The Bentong tailings retention scheme is under construction on the Perting and should be functioning during 1925. That on the Repas is still under consideration. These two schemes are being built by and are under the control of the Public Works Department.

## PART VI.

### MINERAL ORES, NON-FERROUS METAL INDUSTRY AND DANGEROUS TRADES ENACTMENT.

#### MINERAL ORES ENACTMENT.

##### LICENCES.

30. (i) The number of ore buyers' licences issued in 1922, 1923 and 1924, was as follows:

State.	1922.	1923.	1924.
Perak ... ..	125	112	118
Selangor ... ..	68	61	64
Negri Sembilan ... ..	12	12	13
Pahang ... ..	14	12	12
Total ... ..	219	197	207

being an increase of ten.

(ii) The number of sub-licences issued was:

State.	1922.	1923.	1924.
Perak ... ..	169	151	184
Selangor ... ..	41	29	35
Negri Sembilan ... ..	10	10	10
Pahang ... ..	21	17	14
Total ... ..	241	207	243

showing an increase of 36 as compared with the previous year.



## REVENUE COLLECTED.

(iii) Fees collected were as follows:

State.	1922.	1923.	1924.
	\$	\$	\$
Perak ... ..	12,584	11,298	12,720
Selangor ... ..	6,820	6,132	6,575
Negri Sembilan ... ..	1,205	1,205	1,350
Pahang ... ..	1,410	1,213	1,270
Total ... ..	22,019	19,848	21,915

showing an increase of \$2,067 as compared with the previous year.

## COST OF STAFF.

(iv) The cost of the staff employed under the Mineral Ores Enactment was \$17,204 or approximately 78 per cent. of the revenue from fees and fines, as compared with \$18,614 in 1923.

## PROSECUTIONS.

(v) Twenty-eight prosecutions under the Enactment were undertaken during the year: ~~seven~~ <sup>seventeen</sup> in Perak, six in Selangor, two in Negri Sembilan and three in Pahang. Convictions were obtained in twenty-six cases and fines to the amount of \$5,810 were inflicted of which \$1,800 was paid.

Of the total number of cases undertaken, one case was withdrawn, one case was dismissed and in one case the accused was warned and discharged.

There were three appeals to the Supreme Court and in all cases the convictions were upheld but the fines were reduced to a lower figure.

## INSPECTIONS.

(vi) The six Sub-Inspectors visited all licensed premises in their various districts once a month for the purpose of obtaining copies of the licensees' ore-buying transactions during the previous month.

## ORE-BUYING BUSINESS.

(vii) The following table gives an idea of the ore-buying business in the Federated Malay States and, as in former years, the two large European companies operated smelting works in the Colony:

State.	Places licensed.	Smelting houses.	Men smelting.	Men buying and dressing.	Total men.	Roasting furnaces.	Smelting furnaces.	Lan-chutes.	Foot stamps.
Perak... ..	105	4	131	636	767	3	21	128	41
Selangor ... ..	58	4	140	230	370	1	17	47	28
Negri Sembilan ... ..	12	...	...	34	34	...	...	...	...
Pahang ... ..	10	...	...	41	41	...	...	...	...
Total, 1924 ... ..	185	8	271	941	1,212	4	38	175	69
„ 1923 ... ..	170	7	171	908	1,079	5	28	182	78
„ 1922 ... ..	189	6	146	841	989	5	28	178	77

Not included in the above are the licences issued to European companies which were as follows:

Perak, 13; Selangor, 5; Negri Sembilan, 1. Therefore the table represents the ore-buying business under other than European management.

## STAFF.

(viii) The Inspector under the Enactment was on long leave from March 15th until the end of the year, his inspecting duties being performed by the local Inspectors of Mines. There was no alteration in the staff which consists of one European Inspector, six Chinese Sub-Inspectors, and two clerks, one acting as Sub-Inspector in Pahang.

As in former years the European Inspector, in addition to his duties as Inspector under the Enactment, continued to carry out the work of collecting and compiling the Mines Department statistics.

## GENERAL.

The effect of the new Enactment introduced towards the end of 1923 has been most satisfactory, especially in preventing tin stealing, which has now practically ceased in Ulu Slim as a result.



## NON-FERROUS METAL INDUSTRY ENACTMENT.

31. This Enactment was brought into force during 1919 and will continue to remain in force till August 31st, 1926.

The number of licences issued and the fees collected during the years 1922, 1923 and 1924, were as follows:

Year.					Number of licences issued.			Fees collected.
1922 ...	...	...	...	...	19	...		\$190
1923 ...	...	...	...	...	23	...		230
1924 ...	...	...	...	...	29	...		290

The total number of licences issued under this Enactment since its inception in 1919 to the end of 1924 was 411 and the fees collected was \$4,110.

## PART VII.

## THE MACHINERY ENACTMENT.

## PLANT UNDER INSPECTION.

32. (i) The total horse-power of plant installed and registered under the Machinery Enactment was 151,414 (inclusive of hydro-turbines aggregating to 3,667 horse-power), of which 100,478½ horse-power was in operation as against 145,415½ horse-power registered in 1923 and 90,252¾ horse-power in operation that year, showing for the year under review an increase of applied energy of 10,226½ horse-power.

## DISTRIBUTION OF STEAM BOILERS.

(ii) One thousand nine hundred and forty-three boilers were registered with a collective horse-power of 95,902 and were distributed as follows:

State.					Number.			Collective horse-power.
Perak ...	...	...	...	...	1,028	...		55,625
Selangor ...	...	...	...	...	580	...		29,562
Negri Sembilan ...	...	...	...	...	216	...		5,720
Pahang ...	...	...	...	...	119	...		4,995
Total, 1924 ...					1,943	...		95,902
,, 1923 ...					2,092	...		94,871
,, 1922 ...					2,089	...		92,748

a decrease of 49 boilers with an increase of 1,031 horse-power as compared with 1923.

The decrease in the number of boilers is due to boilers which have not been in use for over 10 years, being excluded.

## EMPLOYMENT OF STEAM BOILERS.

(iii) The following table shows the employment of steam boilers:

State.	Mining.		Agricultural.		General.		Government.	
	Working.	Idle.	Working.	Idle.	Working.	Idle.	Working.	Idle.
Perak ...	477	360	14	29	30	37	44	37
Selangor ...	226	234	6	10	14	24	55	11
Negri Sembilan ...	17	145	7	9	32	6	...	...
Pahang ...	34	28	6	6	1	4	35	5
Total, 1924 ...	754	767	33	54	77	71	134	53
,, 1923 ...	644	1,017	37	63	87	56	157	31
,, 1922 ...	553	1,105	38	68	104	70	118	33

The horse-power of steam plant in employment in the year under review aggregated 57,266 and that of unemployed 38,636; figures for the previous year being 50,545 and 44,326, respectively.



## OIL AND GAS ENGINES.

(iv) One thousand one hundred and eighty-eight oil engines with an aggregate horse-power of 34,094 and 326 gas engines with an aggregate horse-power of 17,751 were registered and were distributed as follows:

State.	Oil.		Gas.	
	Number.	Horse-power.	Number.	Horse-power.
Perak ... ..	646	17,729	141	7,953
Selangor ... ..	354	9,750	132	6,897
Negri Sembilan ... ..	157	4,848	48	2,657
Pahang ... ..	31	1,767	5	244
Total, 1924 ...	1,188	34,094	326	17,751
„ 1923 ...	1,095	29,467 $\frac{1}{2}$	317	17,410
„ 1922 ...	1,061	27,929 $\frac{3}{4}$	316	17,350

showing an increase of 93 oil engines of 4,626 $\frac{1}{2}$  horse-power and 9 gas engines of 341 horse-power as compared with 1923.

(v) Employment of oil and suction gas engines was as follows:

State.	Mining.		Agricultural.		General.		Government.	
	Oil.	Gas.	Oil.	Gas.	Oil.	Gas.	Oil.	Gas.
Perak ... ..	186	23	131	64	74	17	8	1
Selangor ... ..	53	16	103	85	33	9	12	...
Negri Sembilan ... ..	1	1	88	34	14	...	7	1
Pahang ... ..	10	1	7	2	3	...	1	...
Total, 1924 ...	250	41	329	185	124	26	28	2
„ 1923 ...	192	45	356	196	113	24	30	2
„ 1922 ...	117	25	365	209	100	26	28	2

The total horse-power of oil engines in employment was 26,031 and of gas engines 13,721 aggregating in 1924 to 39,752 horse-power as compared with 36,072 $\frac{3}{4}$  in 1923.

Eight water turbines of 3,460 horse-power were working and three of 207 horse-power were idle during the year.

## INSTALLATIONS OF MACHINERY.

(vi) Four hundred and seventy-six installations were inspected and were distributed as follows:

Perak ... ..	242
Selangor ... ..	148
Negri Sembilan ... ..	80
Pahang ... ..	6
Total, 1924 ...	476
„ 1923 ...	495
„ 1922 ...	535

showing a decrease of 19 installations as compared with 1923 and 59 in comparison with 1922.



## EXAMINATION OF ENGINEERS AND DRIVERS.

(vii) The following table shows the number of candidates who presented themselves for examination for first and second grade engineers' and engine drivers' certificates, and the results obtained:

State.	Engineer.						Engine Driver.					
	First grade.			Second grade.			First grade.			Second grade.		
	Number presented.	Passed.	Failed.	Number presented.	Passed.	Failed.	Number presented.	Passed.	Failed.	Number presented.	Passed.	Failed.
Perak ... ..	4	4	...	10	7	3	109	87	22	141	110	31
Selangor ... ..	...	...	...	5	5	...	17	17	...	62	61	1
Negri Sembilan...	...	...	...	...	...	...	2	1	1	25	19	6
Pahang ... ..	...	...	...	...	...	...	...	...	...	...	...	...
Total ... ..	4	4	...	15	12	3	128	105	23	228	190	38

Twenty-first and twelve second grade engine drivers' duplicate certificates, to replace the lost or torn ones, were issued during the year under report.

## ACCIDENTS.

(viii) Seventeen accidents occurred, of which five were fatal, eleven serious and three minor; as compared with a total of fifteen and one fatality in 1923. For the year under review ten accidents happened in connection with mining machinery, four resulting in death, five serious injuries and three minor; and seven in connection with rubber machinery resulting in one death and six serious injuries.

## PART VIII.

## CONCLUSION.

33. The tin held by Government was all sold before the end of the year and with similar sales by the other parties to the Bandoeng Agreement was absorbed satisfactorily by the market in spite of some increase in the normal output. There was a fall in the price of tin in the middle of the year but a rise later and the conditions prevailing at the end of the year were very satisfactory.

## THE BRITISH EMPIRE EXHIBITION AT WEMBLEY.

34. The mining section of the Malayan pavilion at Wembley attracted visitors in considerable numbers and great interest was shown by most of them and also by the elder children. Naturally the proportion of visitors technically interested in mining was very small. Appreciation was frequently expressed of the amount of space provided between the exhibits so that there was less congestion than in other parts of the exhibition. The working models proved a great attraction.

There can be no doubt that from an educational point of view the mining section was a success and every child in the country seems to have visited it and the other sections.

## ILLICIT MINING.

35. This has been greatly reduced everywhere. The help given by the new Mineral Ores Enactment whereby ore in transit may be seized unless accompanied by a proper authorising letter has done much to help the department. By cancelling some mining leases on the Pahang side of Ulu Slim the tin stealers could find no further authority for their ore which was seized on several occasions.

The result now is that the Slim river is running practically clear and the Ulu Slim village is empty of inhabitants. Incidentally the effect on the Slim river is interesting as the sands have now started to move down and the bed at the road bridge has come up considerably since last year owing to the increased carrying capacity of the clear water.



## OUTPUT OF ORE PER UNIT EMPLOYED.

36. The output of tin-ore per unit employed, excluding dulang pass holders who won 4.5 pikuls per head, and allowing eight units to one horse-power of plant employed, was 1.38 pikuls as compared with 1.27 in 1923 and 1.36 in 1922.

It is of interest to note that in the year under review the axiom that an increased price of tin meant a reduced output did not hold good. The reason of this was the much smaller proportion of tribute workers, whose output depended on their daily needs, and so caused the effect above together with the great increase from dredges and gravel pumps.

## PROPORTION OF OUTPUT FROM EUROPEAN MANAGED MINES.

37. The proportion of the total output of ore from European owned or managed mines as compared with mines under Chinese management showed an increase of 2.2 per cent. over the previous year. The figures are as follows:

Nationality.	1922.		1923.		1924.		1913.	
	%		%		%		%	
European	...	38.1	...	44.3	...	46.5	...	26
Chinese	...	61.9	...	55.7	...	53.5	...	74

## OUTPUTS FROM LODES AND DREDGES.

38. The proportion of the total output won from lode mining was 5.2 per cent. for the year under review compared with 6 per cent. in 1923 and 6.8 per cent. in 1922.

Although the Pahang Consolidated Company Limited are responsible for nearly the whole of the output from lodes, there is a steady increase of output from such workings elsewhere, and it is satisfactory to note that both Menglembu Lode and Titi are making considerable efforts to get into working shape again.

39. There was an increase of 22,109 pikuls over 1923 in the production by bucket dredges although the percentage of the total output so won shows a slight decrease of .2 per cent. compared with the previous year, the figure for 1924 being 21.8 per cent. representing 161,878 pikuls.

40. The expectations of a largely increased output from Bolivia did not materialise there was a moderate increase only. This was mainly owing to an abnormally short rainy season which interfered with ore dressing operations, and further, owing to the imposition of a larger duty. The latter factor was neutralised during the latter part of the year by the higher tin price obtaining. Mining is now being carried on there with considerable activity and there is every indication of a notable increase in the output for 1925, providing the tin price does not slump appreciably.

41. As the market seems prepared to absorb all and more of the world's output, there does not seem to be any cause for alarm, and the mining industry in Malaya is in as prosperous and stable a condition at the present time as it has been for several years.

42. The price of tin is very satisfactory and wholesome; the Bandoeng stocks have been absorbed; visible supplies are normal and show a downward tendency; machinery is good and economical and reasonable in price; and everything tends towards a very successful year, and it is to be hoped that the tin price will help by remaining reasonably stable.

SENIOR WARDEN OF MINES' OFFICE,  
Kuala Lumpur, 9th March, 1925.

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